Ain Shams University
Faculty of Science
Entomology Department

Evaluation of some natural plant oils for the control of the rice weevil *Sitophilus oryzae* (Coleoptera: Curculionidae) on wheat

By
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B.Sc. Entomology, Faculty of Science,
Cairo University
(1992)

A thesis
Submitted in Partial Fulfillment for the Award of
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ABSTRACT

Laboratory bioassays were carried out to determine the insecticidal efficacy of ten plant oils against the rice weevil *Sitophilus oryzae* on wheat grains. The oils were celery, camphor, garlic, dill, onion, ginger; bitter almond, thyme, rosemary and olbanum oils. Insect mortalities increased with increasing concentrations of all plant oils and with increasing exposure time. From the bioassay LC_{50}'s and LC_{95}'s levels were estimated. The most promising oils, celery, camphor and garlic were selected for in-depth study. The results showed that, Persistence activity was gradually decreased with the increasing of storage periods up to 15 weeks for both celery and camphor oils, 22 weeks for garlic oil. Complete prevention in F_1 progeny was caused by the three oils. LC_{50}'s of three oils caused a highly significant decrease in the mean number of eggs laid as compared to the control. No eggs were obtained when the wheat grains treated by the LC_{95}'s of three tested oils. No offspring was obtained at LC_{50}'s and LC_{95}'s. Biochemical studies showed that total proteins, lipids and carbohydrates contents were significantly decreased. Furthermore, different levels of significant changes in the carbohydrases, protease, phosphatases and acetylcholine esterase activity were recorded. No obvious side effects on the weight loss, the water absorption and the germination of wheat grains treated with the three tested oils.

Key words: Rice weevil, *Sitophilus oryzae*, plant oils, celery, camphor, garlic, toxicity, wheat grains.

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